between the plurality of magnetic elements and the process chamber, see figs. 7-9, and their description for specifics.

Saito et al. does not disclose a magnetic array having a plurality of magnetic elements configured to produce a magnetic field establishing a plurality of cusp patterns on the wall as recited in **Claim 1**. Page 10, line 24-25, of the present application states that "Cusps 708A form adjacent magnetic elements where field lines group together..." as shown in FIG 3A. FIG. 9 of Saito illustrates a magnetic field, defined in column 11, lines 49 to 53, as a cusped magnetic field. This cusped magnetic field generates a single cusp around the chamber wall, instead of a plurality of cusp patters as recited in claim 1. The applicant could not find anything in Saito et al. that discloses creating a plurality of cusp patterns on the chamber wall as recited in claim 1. For these reasons, claim 1 is not anticipated by Saito et al.

Claims 2, 3, and 5 are ultimately dependent on claim 1. For this reason, claims 2, 3, and 5 are not anticipated by Saito et al.

Regarding claims 6 and 7, the Examiner stated that the limitations of claim 6 and 7 are method limitations. The applicants contend that the limitations of claim 6 is for an apparatus, where the limitation is that the device for changing the cusp is able to continuously change the cusp pattern on the wall. This limits the apparatus to a device that is able to provide non-discrete changes. The Examiner did not point to anything in Saito et al. that provides non-discrete changes. In addition, claims 6 is dependent on claim 3. For these reasons, claim 6 is not anticipated by Saito et al.

The applicants contend that the limitations of claim 7 is for an apparatus, where the limitation is that the device for changing the cusp is able to incrementally changes the cusp pattern. This limits the apparatus to a device that is able to provide discrete changes. The Examiner did not point to anything in Saito et al. that provides discrete changes. In addition, claim 7 is dependent on claim 3. For these reasons, claim 7 is not anticipated by Saito et al.

The Examiner rejected claim 1 as being anticipated by U.S. Patent No. 6,113,731 to Shan et al., hereinafter Shan. The Examiner stated that Shan shows the invention as claimed including a plasma processing apparatus for processing a substrate, comprising a process chamber, defined at least in part by a wall, within which plasma is ignited and sustained for said processing, a magnetic array having a plurality of magnetic elements 40, 42, 50, and 52, disposed around the periphery of the process chamber and producing a magnetic field

establishing a plurality of cusp patterns; and a device 60, 62, and 65, for changing the cusp pattern with respect to the wall connected between the plurality of magnetic elements and the process chamber, see figs. 2A, 2B, 3A, and 3B, and their description for specifics.

Shan et al. does not disclose a magnetic array having a plurality of magnetic elements configured to produce a magnetic field establishing a plurality of cusp patterns on the wall as recited in **Claim 1**. Page 13, line 11-13, of the present application states that "As Seen in Fig. 3A the convergence and resulting concentration of the field lines 706A defining field 704A creates a number of nodes or cusps 708A forming a cusp pattern about the chamber wall 303." The Examiner failed to point out any teaching about cusps in Shan. The Examiner did not specifically point out a plurality of cusp patterns generated on the wall as recited in claim 1. For these reasons, claim 1 is not anticipated by Shan et al.

Rejections under 35 U.S.C. § 103

The Examiner rejected claims 4 and 8-18 as being made obvious by U.S. Patent No. 5,587,205 to Saito et al. in view of U.S. Patent No. 6,113,731 to Shan et al. The Examiner stated Saito et al. does not expressly disclose that the magnet elements are permanent magnets, but it would have been made an obvious choice of design to one having ordinary skill in the art to use permanent magnets because such magnetic elements are well known and used in the are as disclosed by Shan et al. in col. 3, lines 45-47 and in col. 9, lines 56-59, and because there is not evidence that the choice of a particular magnetic element would significantly affect the overall performance of the plasma processing apparatus. The Examiner further stated that with regards to claims 8-18 that Saito et al. does not expressly disclose the use of the claimed device for physically rotating the magnetic elements, but that Shan et al., in col. 4, lines 52-55, discloses that it is known in the art to rotate a magnetic field by physically rotating either the wafer or the magnets, as well as performing magnetic field rotations electronically, and therefore would have been obvious to modify Saito et al. to optimize the apparatus and the method performed by the apparatus.

Claim 4 is dependent on claim 3 and further recites that the magnets are permanent magnets. The magnet elements 26a, 26b, 26c, and 52 of Saito are ring shaped electromagnets. Such a configuration provides a magnetic field, where the B field is along the axis of the chamber, as shown in Figure 9. To replace the electromagnetic rings 26a, 26b, 26c, and 52 of Saito with permanent magnets, the permanent magnets would need to be placed to create a B field along the axis of the chamber, as shown in Figure 9. It would not

be obvious how permanent magnets may be placed to obtain the magnetic field disclosed in Saito for use in a process chamber. The placement of permanent magnets in the center of the process chamber to obtain the magnetic fields of Saito may interfere with the plasma. For these reasons, claim 4 is not made obvious by Saito in view of Shan.

Claim 8 is dependent on claim 3, and further recites that the device for changing the cusp pattern comprises a device for moving at least one of the magnetic elements. Since Saito does not disclose a plurality of cusp patterns, but instead a single radially symmetric cusp rotation of the magnets as taught in Saito would not change the cusp pattern. Such a rotation would not improve the performance of Saito. Therefore it would not be obvious to modify Saito to provide physical rotation of the magnets. For these reasons, claim 8 is not made obvious by Saito in view of Shan.

Claim 9 is dependent on claim 8, and further recites that the device for moving the at least on of the magnetic elements comprises a drive for moving a plurality of the magnetic elements individually. The Examiner failed to point how the ring magnets of Saito would be moved individually to optimize the apparatus. Such movement is not obvious. For these reasons, claim 9 is not made obvious by Saito in view of Shan.

Claim 10 is dependent on claim 9, and further recites that the device for moving said plurality of magnetic elements comprises a device for rotating said magnetic elements in an alternating pattern. The Examiner did not point out how the ring shaped electromagnets of Saito would be alternately rotated to optimize the apparatus. For these reasons, claim 10 is not made obvious by Saito in view of Shan.

Claim 11 is dependent on claim 9, and further recites that the device for moving said plurality of magnetic elements comprises a device for rotating said magnetic elements in a same direction. The Examiner did not point out how the ring shaped electromagnets of Saito would be rotated in the same direction to optimize the apparatus. For these reasons, claim 11 is not made obvious by Saito in view of Shan.

Claim 12 is dependent on claim 8, and further recites that the device for moving at least one of the magnetic elements comprises a device for moving the array as a unit relative to the process chamber. The Examiner did not point out how the ring shaped electromagnets of Saito would be rotated as a unit to optimize the apparatus. For these reasons, claim 12 is not made obvious by Saito in view of Shan.

Claim 13 is dependent on claim 12, and further recites that the device for moving the magnetic array comprises a device for rotating the array around the chamber. The Examiner did not point out how the ring shaped electromagnets of Saito would be rotated around the chamber to optimize the apparatus. As discussed above, the applicants could not see how such a rotation would improve Saito, which provides a single radially symmetric cusp. For these reasons, claim 13 is not made obvious by Saito in view of Shan.

Claim 14 is dependent on claim 12, and further recites that the device for moving said magnetic array comprises a device for moving said array closer and farther away from said chamber. The applicant does not understand and the Examiner has failed to explain how the ring shape electromagnets of Saito may be moved closer to and farther from the chamber to optimize the apparatus. For these reasons, claim 14 is not made obvious by Saito in view of Shan.

Claim 15 is dependent on claim 2, and further recites that the device for changing said cusp pattern comprises a device for moving at least part of said chamber wall. The Examiner did not point out anything in Saito or Shan that discloses moving at least part of the chamber wall. For these reasons, claim 15 is not made obvious by Saito in view of Shan.

Claim 16 is dependent on claim 15. For this reason claim 16 is not made obvious by Saito in view of Shan.

Claim 17 is dependent on claim 15, and further recites that the device for moving at least part of said chamber wall comprises a device for moving part of the chamber wall that is an inner chamber wall forming a liner. The Examiner failed to point out anything in Saito or Shan that discloses an inner wall which is rotated. For these reasons, claim 17 is not made obvious by Saito in view of Shan.

Claim 18 is dependent on claim 2, and further recites that the device for changing the cusp pattern comprises a device for moving at least part of a flux plate assembly within the magnetic field. The Examiner failed to point out anything in Saito or Shan that discloses moving a flux plate. For these reasons, claim 18 is not made obvious by Saito in view of Shan.

The Examiner rejected claims 2-18 as being made obvious by U.S. Patent No. 6,113,731 to Shan et al. The Examiner stated that Shan is applied as above but does not

expressly disclose the use of a chuck, but the Examiner takes official notice that chucks are known and used in the art for supporting and holding the substrate. The Examiner further stated that Shan discloses in column 3, lines 45-47, and in column 9, lines 56-59, the use of permanent magnets or electromagnets as the magnetic elements and that with respect to claims 8-18 that Shan in column 4, lines 52-67, clearly discloses that it is known to physically rotate either the wafer or the magnets, as well as performing magnetic field rotations electromagnetically. The Examiner further stated that regarding claims 3 and 6-7, that these claims are directed to method limitations instead of apparatus limitations, and that since an apparatus is being claimed as the instant invention, the method teachings are not considered to be the matter of hand, since a variety of methods can be done with the apparatus. The Examiner further states that the apparatus of Shan et al. either performs the claimed limitations or is capable of performing them.

Claim 2 is dependent on claim 1. For this reason, claim 2 is not made obvious by Shan.

Claim 3 is dependent on claim 2, and further recites that the magnetic field has an azimuthally symmetric radial gradient. An azimuthally symmetric radial gradient is a description of an element of an apparatus, not a step of a method. For this reason, this limitation is an apparatus limitation, not a method limitation as stated by the Examiner. Shan does not disclose or make obvious an azimuthally symmetric radial gradient. For these reasons, claim 3 is not made obvious by Shan.

Claim 4 is dependent on claim 3, and further recites that the magnetic elements are permanent magnets. Limitations that permanent magnets are located to provide an azimuthally symmetric radial gradient are apparatus limitations. For these reasons, claim 4 is not made obvious by Shan.

Claims 5-8 and 12-13 are ultimately dependent on claim 3. For this reason, claims 5-8 and 12-13 are not made obvious by Shan.

Claim 9 is dependent on claim 8, and further recites that the device for moving at least one of the said magnetic elements comprises a device for moving a plurality of the plurality of magnetic elements individually. The Examiner did not point out anything in Shan that makes obvious rotating the magnetic elements individually. For these reasons, claim 9 is not made obvious by Shan.

Claim 10 is dependent on claim 9, and further recites that the device for moving said plurality of magnetic elements comprises a device for rotating said magnetic elements in an alternating pattern. The Examiner did not point out anything in Shan that makes obvious rotating the magnetic elements in an alternating pattern. For these reasons, claim 10 is not made obvious by Shan.

Claim 11 is dependent on claim 9, and further recites that the device for moving said plurality of magnetic elements comprises a device for rotating said magnetic elements in a same direction. The Examiner did not point anything in Shan that makes obvious rotating the magnetic elements in the same direction. For these reasons, claim 11 is not made obvious by Shan.

Claim 14 is dependent on claim 12, and further recites that the device for moving said magnetic array comprises a device for moving said array closer and farther away from said chamber. The Examiner failed to point out anything in Shan that makes obvious a device for moving the array closer and farther away from the chamber. For these reasons, claim 14 is not made obvious by Shan.

Claim 15 is dependent on claim 2, and further recites that the device for changing said cusp pattern comprises a device for moving at least part of said chamber wall. The Examiner did not point out anything in Shan that discloses moving at least part of the chamber wall. For these reasons, claim 15 is not made obvious by Shan.

Claim 16 is dependent on claim 15. For this reason claim 16 is not made obvious by Shan.

Claim 17 is dependent on claim 15, and further recites that the device for moving at least part of said chamber wall comprises a device for moving part of the chamber wall that is an inner chamber wall forming a liner. The Examiner failed to point out anything in Shan that discloses an inner wall which is rotated. For these reasons, claim 17 is not made obvious by Shan.

Claim 18 is dependent on claim 2, and further recites that the device for changing the cusp pattern comprises a device for moving at least part of a flux plate assembly within the magnetic field. The Examiner failed to point out anything in Shan that discloses moving a flux plate. For these reasons, claim 18 is not made obvious by Shan.

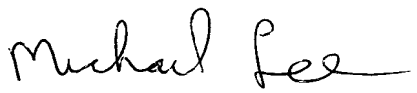
Claims 28 to 36 have been added. Claim 29 recites that each magnetic element is axially oriented about the periphery of the process chamber. Being axially oriented is described on page 10, lines 19-21 as having either pole point towards a chamber axis. Claim 30 recites that the device for changing the cusp patterns comprises a device for rotating at least one magnetic element around an axis of rotation, which passes through the at least one magnetic element. Page 14, lines 19 to 20, states that a magnetic element is rotated about its physical axis 702p to support claim 30.

In view of the amendments and arguments set forth herein, it is respectfully submitted that the applicable rejections have been overcome, and that all pending claims are in condition for allowance.

If there are any issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at (831) 655-2300.

Applicants hereby petition for an extension of time that may be required to maintain the pendency of this case. Any required fee for such extension or any further fee required in connection with the filing of the Amendment is to be charged to Deposit Account No. 50-0388 (Dkt. No. LAM1P130).

Respectfully submitted,
BEYER WEAVER & THOMAS, LLP



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